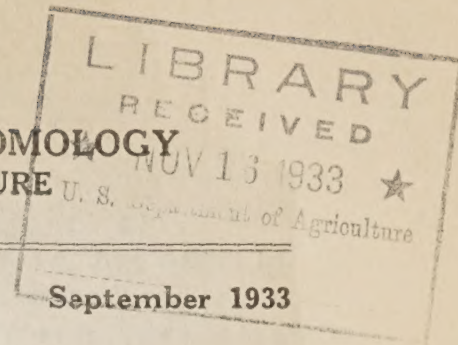


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MONTHLY LETTER OF THE BUREAU OF ENTOMOLOGY
UNITED STATES DEPARTMENT OF AGRICULTURE



Number 233

Activities for August
(Not for publication)

September 1933

DOCTOR MARLATT RETIRES

Dr. C. L. Marlatt celebrated his 70th birthday on September 26. That evening some 160 of his friends and associates participated in a dinner in his honor at the Cosmos Club. With J. E. Graf presiding, toasts were given by Dr. A. F. Woods, Dr. Wm. A. Taylor, W. G. Campbell, Lee A. Strong, and S. A. Rohwer. In his response Dr. Marlatt reviewed his 45-years' service in the Department of Agriculture and described the development of the Bureau of Entomology. Dr. Marlatt retired from Government service on September 30. Employees of the bureau and associates in the department bade him good-bye in his office and as a token of esteem his friends in the bureau presented him with a watch.

LEE A. STRONG NEW CHIEF OF BUREAU

Lee A. Strong, former chief of the Bureau of Plant Quarantine, and before that assistant director of the California Department of Agriculture, was appointed chief of the Bureau of Entomology, succeeding Dr. C. L. Marlatt, on October 1. In announcing the appointment, Secretary Wallace pointed out that the work of the Bureaus of Entomology and Plant Quarantine is closely related and that the transfer of Mr. Strong to the Bureau of Entomology will reestablish the close working arrangement between the two bureaus that existed until control and research work were definitely separated in 1928. In referring to the work of the two bureaus, the Secretary stated:

"The Bureau of Entomology is a research institution, charged with investigations and demonstrations for the promotion of economic entomology; it seeks the best means of destroying injurious insects and the development of beneficial ones. The Bureau of Plant Quarantine is responsible for the enforcement of quarantines promulgated to prevent the entry or dissemination of dangerous plant pests new to or not widely distributed within the United States; it is also responsible for carrying on, in cooperation with the States, necessary work to prevent the spread or to eradicate pests that may have gained local foothold."

STORED PRODUCT INSECTS

Cardboard impregnated with cedar oil not effective against clothes moths.-- Tests conducted by Wallace Colman, Takoma Park, Md., with cardboard chests impregnated with cedar oil or cedar chips indicate that they "are absolutely worthless as protection against clothes moths. A piece of uninfested woolen cloth was placed inside each of two such closets and two such chests, which were set up inside a 130 cubic foot closet constructed of wallboard. Adult clothes moths were then introduced inside the large closet on August 8, 11, and 16, 1933. On September 5 the closets and chests were opened and large numbers of adult clothes moths were found inside. The cloth was heavily infested with clothes moth larvae, which had seriously damaged it. It is evident that clothes moth adults can readily pass through the cracks of such closets and chests and that they are not sufficiently tight to give any protection to clothing against damage by moths."

The raisin moth.-- H. C. Donohoe, of the Fresno, Calif., laboratory, has obtained records of the infestation of various fruits by the raisin moth (Ephestia figulilella Greg.). In first-crop Mission and Adriatic figs he found infestations of 680,000 and 355,000 larvae per dry ton, respectively; in Zante grapes ("currants"), an infestation of 192,000 larvae and pupae per ton; in apples, light infestation; in Santa Rosa and in Red Beauty plums on the ground, 992,000 and 576,000 larvae per dry ton, respectively; in white nectarines on the ground, 294,000 larvae per ton; fallen pears contained 51,000 raisin-moth stages per green ton; and fallen apricots, dried under trees, contained 34.6 larvae and pupae per fruit, or 5,264,000 per dry ton (pits included), the heaviest field infestation recorded in any of the food materials of the raisin moth. Mr. Donohoe notes that "recent examinations of a variety of fallen fruits exposed to the sun showed no living stages of Ephestia. The infestations recorded above were found in fruits collected from shaded locations." He "has found that all living larvae in samples of such fruit can be caused to leave the material by exposing it in a deep pan to the heat of a 100-watt electric light for about 30 minutes."

Buried traps for dried-fruit beetles.-- Perez Simmons, Fresno, reports the results of further trapping of dried-fruit beetles: "During the period from August 17 to 24, two beetle traps set on the surface in a planting of Adriatic figs captured 70 Carpophilus hemipterus L. and 156 miscellaneous Nitidulidae. Two traps buried to the lid under adjacent trees took 359 C. hemipterus and 579 miscellaneous Nitidulidae. The advantage of buried traps indicated by previous trials is supported by these results, which show that lowering the entrance of the traps to the surface of the soil is advantageous in hot weather as well as in cold weather (March 1933 Monthly Letter, p. 6-7)."

Successful fumigation of tobacco warehouse.-- Austin W. Morrill, Jr., Richmond, Va., reports: "On August 14 we cooperated in the fumi-

gation of 880,000 cubic feet of storage at Tidewater, Va. The dosage of liquid hydrocyanic acid was 1 pound per 1,000 cubic feet, and test lots showed a complete kill of insects to a depth of 6 inches in the hogsheads."

Birds and rodents destroy pea weevils.-- "In collecting peas from the ground," reports A. O. Larson, Corvallis, Oreg., "we have noticed that rodents will open peas and eat the contained weevils, leaving the peas. This is especially noticeable near the holes of the Douglas ground squirrel (Citellus douglassi (Richardson)). Mice are fond of weevils in the warehouse. Violet-green swallows may be seen congregated over badly infested pea fields on warm days when the weevils are flying about. The swallows undoubtedly get great numbers of pea weevils in the fall."

On community cooperation in combating the pea weevil, Mr. Larson says: "The pea growers around Barlow have been converted to the advantage of burning pea stubble before the weevils emerge. Their low rate of infestation is a good demonstration of how the infestation may be held down by burning. This year it was made a community movement. * * * With the precautions (described) and the number of men present the fire did a good job in the pea fields without spreading to anything else. A total of 15 small fields, or about 200 acres, were thus burned."

Federal pea grades established in Idaho.-- T. A. Brindley, Moscow, Idaho, reports that "Federal pea grades become a reality in the district in August. The establishment of the grades places a decided emphasis on weevil-damaged peas and also increases the necessity for (and the interest of growers in) adequate control measures. The weevil tolerance set for the various grades is as follows: U.S. Extra No. 1, 0.5 percent; U.S. No. 1, 0.5 percent; U.S. No. 2, 1.0 percent; and U.S. No. 3, 1.5 percent. The percentage is determined by actual count."

Preoviposition of pea weevil in Idaho.-- Mr. Brindley says that "The last of the females from the 1931 crop which was under observation for egg laying died on August 4, after having laid a total of 467 eggs. This is especially interesting for, in addition to proving that weevils can survive for two crop seasons, it shows that these weevils are capable of laying large numbers of eggs." Daily observations on 25 adults taken directly from last year's crop of peas and placed on pea blossoms and pods showed 14 days to be the longest and 4 days the shortest time that elapsed until the first eggs were laid, the length of time being apparently dependent largely on weather.

Oviposition of fall-emerging pea weevils in Oregon.-- At Corvallis, Oreg., as reported by Mr. Larson, it was found "that some weevils which emerged this fall have already been laying eggs. Several weevils from peas grown this year were put in a vial with blossoms and pods on

July 27 and they began to lay eggs on August 11. One weevil has laid 119 eggs. The eggs thus far examined, however, have been infertile. It is important to know that more than one generation of weevils is possible when food conditions are favorable, as it applies to crops of early and late peas grown in the same territory, the practice in some parts of Oregon."

Pea-counting machine developed.-- Mr. Brindley describes a piece of apparatus devised to facilitate the work of counting peas. It "consists essentially of a board 1/4 inch thick, perforated by 500 5/16 inch holes set over slide and drawer. The holes are filled by spreading peas about the top. * * * One 500-pea sample can be counted and sacked in 1 minute. This machine has already been copied by the pea-grad-ing laboratory at the University of Idaho and by one of the leading pea firms."

BEE CULTURE

Improvement in honey-heating apparatus.-- "Several changes have been made in the apparatus for heating honey," reports G. E. Marvin, Somerset, Md. "The principle is that the honey is run over a heated plate, coming in contact with the heat for only about 1 minute. It is apparently possible to heat honey much higher than 160° F., which has been believed to be the maximum, without damaging it. In trial runs honey just as it left the hot plate registered 180° to 185° F. without apparent harm. Further refinements will have to be made in the apparatus before it can be recommended to the trade. Difficulty is still experienced by the formation of fine scum after the honey is run into the bottles. However, this type of apparatus has a number of advantages. Bottling can be started after preliminary heating of only half an hour, and it is not essential to heat a large volume of honey at any one time. By the use of heating in excess of 160° F., the honey is thoroughly pasteurized."

FRUIT AND SHADE TREE INSECTS

Tartar emetic-molasses spray does not deteriorate with age.-- O. C. McBride, in charge of the field laboratory at Honolulu, Hawaii, has conducted a series of tests of a tartar emetic-molasses bait spray, which has been found of value against the Mediterranean fruit fly (Ceratitis capitata Wied.). The material in these tests was atomized on paraffin paper and flies were introduced into the cages 5, 11, 15, and 25 days later. The conclusions drawn from the experiments are stated by Mr. McBride as follows: "On the basis of the data presented herein, the toxic principle of the tartar emetic-molasses spray does not deteriorate with age. The spray is lethal so long as a sufficient quantity of the spray remains available for a toxic dosage. Under field conditions the spray remains effective and is governed by the elements of the environment. Washing of the spray by rain would be the greatest limiting factor."

Nicotine kills 3-day-old codling moth larvae in fruit.--- Fred Dean, Yakima, Wash., has conducted tests with nicotine sulphate to determine whether this material will kill young codling moth larvae that have already entered the fruit. The tests included apples which newly hatched larvae had entered two days and three days previously. The apples were thoroughly sprayed with a solution of nicotine sulphate 1 to 1,600 with a mineral oil emulsion at 1 percent. No larvae were found dead in the unsprayed apples, whereas in the sprayed fruit 29 percent of the 2-day-old larvae and 13 percent of those that were 3 days old were found dead.

Parasite of woolly apple aphid established in Wenatchee, Wash.--- Late in August M. A. Yothers made a survey to determine the results of the liberations of Aphelinus mali Hald., a parasite of the woolly apple aphid (Eriosoma lanigerum Hausm.), referred to in the Monthly Letter, October 1931. Mr. Yothers reports as follows: "In the Van Valkenburg orchard and in all orchards surrounding it and in the orchards adjoining these still farther away, there are actually millions of the parasitized woolly aphids. It is established that this area of Aphelinus establishment covers several hundred acres of orchards. In the Chase orchard, about 1 mile from the Van Valkenburg orchard, 2,000 parasites were released on Sept. 24, 1931. On Aug. 28, 1933, it was found that the parasites had not only become very well established in this tract, but were also established in all orchards adjoining it on four sides and in orchards adjoining these still farther away. While the parasite has not become sufficiently abundant to afford efficient control it is not uncommon to find as many as 200 to 250 parasitized woolly aphids on a 2-foot twig."

Bordeaux mixture not detrimental to oil sprays for codling moth.--- R. F. Sazama, Vincennes, Ind., makes the following report on experiments to determine the influence of Bordeaux mixture on oil sprays used for the control of the codling moth (Carpocapsa pomonella L.): "It has been found at this laboratory that solid substance in a dormant oil spray as, for instance a 3-3-50 Bordeaux, will decrease the efficiency of the spray in the control of the San Jose scale. From this one might readily conclude that similar solid material, such as lime, lead arsenate and lime, or Bordeaux (1-3-50), would also have a detrimental effect upon summer oil emulsions used as ovicides against the codling moth. It was surprising that experiments designed to bring out these points showed, on the contrary, an increase in efficiency upon the addition of solid materials. These experiments have been replicated several times and the strength of oil reduced to sublethal dosages in order to magnify slight differences in control. All thus far completed point definitely to the increased efficiency of the oils upon the addition of lime, lead arsenate and lime, and lead arsenate and 1-3-50 Bordeaux. This information is considered highly significant, especially as this year it has been discovered that small quantities of lime added to the oil spray tend to prevent the

blotch type of coverage usually accompanied with a spotting of the fruit on such varieties as Grimes Golden, Jonathan, and Red Delicious."

JAPANESE BEETLE AND ASIATIC BEETLE RESEARCH

Wind and water aid in dispersing Jap. beetle.-- From I. M. Hawley, Moorestown, N. J., we have the following: "In the monthly report for July it was noted that R. J. Sim had found Japanese beetles being carried first by wind and then by water across Delaware Bay from the heavily infested area in Cumberland County, N. J., to the eastern shore of Delaware. Many of the beetles were alive when picked up on the Delaware beach. Additional evidence that beetles may be carried in this way was found in August, when C. W. Stockwell, of the Bureau of Plant Quarantine, informed us that C. H. Zimmer, in charge of quarantine work in New York City, had notified him that on July 29 Japanese beetles were being washed up on the south shore of Staten Island, near Princes Bay. About 25 percent of the beetles were still alive. A resident of Princes Bay, who had observed the beetles, wrote to the Moorestown laboratory that, 'As the beetles dried off they at once flew away.' Mr. Zimmer stated further that he was informed by a motor boat captain that as he was half way between Keyport, N. J., and the southern shore of Staten Island, at a distance of 3 miles from either shore, beetles came down on his boat so thick that he could scrape them up with his hands. On August 2 Mr. Zimmer found a distinct line of beetles washed on Long Beach. He estimated that there were 100 beetles per linear yard. Subsequently he visited Jones Beach, much farther east, and found dead beetles, although in smaller numbers. On August 6 the writer was at the Westbury sublaboratory and with H. C. Hallock visited Jones Beach, where a few dead beetles could still be found, although many had been tramped into the sand by bathers. The vegetation along the shore was examined but no live beetles were found. At the time these flights are believed to have occurred the direction of the wind was almost entirely from the southwest, and wind velocity in the warmer parts of the day was from 7 to 15 miles per hour, although at New York City on the afternoon of August 28 the velocity reached 20 miles per hour. The weather was hot at this time, especially from July 29 to August 2, and it was expected that beetles would be in active flight."

Unfavorable weather reduces trap catch of Jap beetle.-- F. W. Metzger, Moorestown, states that "During the month (August) only 1,300,000 beetles were taken in the experimental traps, making the total for the season 15,645,000, a reduction of nearly 1,000,000 as compared with 1932. The total for July was much greater than for July 1932, but the number taken in August was considerably smaller. This is probably accounted for by the fact that the beetles emerged earlier in 1933

than in the previous year and also by the fact that because of abnormally high temperature the weather during the first week in August was generally unfavorable for beetle response. The traps were withdrawn during the period August 18-23, as the last complete collection from the 400 traps on August 15 totaled only 83,000 beetles."

Root crops grown in soil treated for Jap. beetle grubs contain arsenic.--- Reporting on the control of Japanese beetle larvae in truck crops, F. E. Baker, Moorestown, says: "The various truck crops growing in the experimental garden containing plots treated with lead arsenate at the rates of 1,000, 1,500, and 2,000 pounds per acre have been harvested and analyzed as they matured. The indications at the present time are that the majority of vegetables grown produce normally, even in these strong dosages. However, string and lima beans were definitely injured by the treatment. Analyses to date show that all root crops, such as radishes and turnips, contain more than the legal tolerance of arsenic, whereas other crops bearing the edible portion above ground, such as tomatoes and egg plants, although containing some arsenic, are well below the legal tolerance of 0.01 grain per pound."

TRUCK CROP AND GARDEN INSECTS

Correction.--- In the July 1933 Monthly Letter p. 4, line 40 should read -- larvae of the southern armyworm were used.

On the control of Fuller's rose beetle.--- H. H. Richardson, of greenhouse-insect investigations, Washington, D. C., reports: "In studies on the effectiveness of various insecticides against Asynonychus godmani Crotch the preliminary tests indicate that the beetles are very sensitive to the action of pyrethrum powder, which produces a quick paralysis and great irritation, accompanied by considerable regurgitation. The beetles become moribund but do not die for considerable lengths of time--two weeks or more. The arsenicals apparently exert a deterrent effect and beetles do not feed on treated foliage. Beetles caged on foliage dusted with lead arsenate got the dust on their tarsi and were slightly affected but did not die for 10 or 12 days. Both sodium fluoaluminate and barium fluosilicate dusts are very promising and their killing action was much faster."

Parasitization of beet leafhopper on Russian thistle higher in new fields.---W. C. Cook, Modesto, Calif., reports that H.E. Wallace and F.R. Lawson "investigated some 15 fields of Russian thistle in the Mendota area with the view of determining the correlation between extent of parasitization and the age of field, size of thistle, and population of Eutettix tenellus Bak. present. The indications are that there is no correlation except that parasitization runs higher in new fields the first year. This is evidence against the probability of parasites building up in old fields by hibernating there. Mr. Lawson had previously observed that E. tenellus populations in low thistle are almost negligible, and the investigations in these fields bore this out. It is probable that the

percentage of parasites builds up more rapidly in high populations of E. tenellus, which would explain the higher parasitization in new fields because new fields as a rule run to high thistle, whereas old fields run to low."

FOREST INSECTS

Kites used to trap insects at high elevations.--T. T. Terrell, Coeur d'Alene, Idaho, states that in order to learn more of the flight habits of the mountain pine beetle (Dendroctonus monticolae Hopk.), "a number of weathervane-insect traps were placed along the Continental Divide in the Glacier National Park in an attempt to determine whether these insects are migrating from the heavy infestation on the west side of the park to the uninfested eastern timber stands. On the Beaverhead National Forest large Weather Bureau box kites were used to carry insect traps to various heights, in the hope of obtaining adults of the mountain pine beetle. This is the first time that such equipment has ever been used for the trapping of insects at high elevations. Although the project was not successful in obtaining mountain pine beetles, other bark beetles and a number of other insects were taken. This equipment offers a cheap and economical method of studying insect flights."

Record winter kill of western pine beetle in Oregon.--The aid of the low temperatures of the past winter (1932-33) in effecting control of the western pine beetle (Dendroctonus brevicomis Lec.) has been previously referred to in the Monthly Letter (See Numbers 225, 226). J. A. Beal, Portland, Oreg., now reports: "Last winter a new cold weather record for Oregon of 54 degrees below zero was established at Seneca, near this area. Examination of infested bark after the freeze showed that at least 85 percent of the larvae had been killed. Bark examinations made by Beal and three Civilian Conservation Corps helpers showed that on the average only 3 beetles per square foot had escaped from overwintering trees. This is a reduction of about 95 percent from normal emergence and is the most nearly complete extermination of the western pine beetle by cold weather of which we have any record."

Seasonal history of mountain pine beetle.--Reporting on studies of Dendroctonus monticolae, G. R. Struble, Berkeley, Calif., says, "From seasonal-history records obtained from 8 caged trees, 7 trap trees, and 6 standing trees attacked under natural conditions, the following salient points are evident: (1) New adults from the first main summer generation have been emerging for the past 4 weeks, with the brood stages at present from mature larvae to black adults still under the bark; (2) the broods reaching most rapid development occur in trap logs or standing trees that have not resisted the initial attacks; (3) the period of emergence of new adults in a given tree is carried over a period of from 3 to 9 weeks; (4) a minimum of 5 weeks was required to produce a generation of new adults in a trap log from the time of first attack, and a period of 2 to 3 weeks is required between the callow adult stage and

emergence; (4) a slightly more rapid rate of development for Dendroctonus monticolae broods occurred at 7,000 feet elevation than at 3,800 feet, even though daily maximum and minimum temperatures at the higher elevation were 10 degrees lower in each case. Evidence in this case leads to a belief that too high temperatures retard development; (5) in an emergence-reattack cage, only five attacks were made on the second tree from reemerged beetles after a period of 2 months."

CEREAL AND FORAGE INSECTS

Response of sorghum midge to humidity.--E. V. Walter and Lee Seaton, San Antonio, Tex., state that "During June and July the sorghum midge (Contarinia sorghicola Coq.) was so scarce as to be hardly noticeable * * * Apparently during the extreme drought many of the larvae and pupae entered a period of aestivation and emerged as adults in the fields after the August rains set in. The sorghum fields in general show extreme irregularity in blooming this year, owing to the drought. Heads that appeared in June and July were so rare that they were not harvested and were left standing in the fields. A heavy emergence has come from these heads, and the heads maturing later are now rather heavily infested with the midge. This again shows the value of crop uniformity in the control of the midge."

Unusual migration of leafhoppers.-- "An unusual migration of Empoasca fabae Harr. took place on August 8 and 9. Diabrotica 12-punctata also came to light in great abundance on August 8," reports F.W. Poos, of Arlington Experiment Farm, Rosslyn, Va. "The wind traps also recorded this unusual migration. An examination of this Empoasca material showed that less than 3 percent were females."

Three-lined blister beetle distinguishes species of Crotalaria.--W. A. Douglas, Crowley, La., reports that "Epicauta lemniscata Fab. attacked Crotalaria spectabilis and completely defoliated it, while they did not touch Crotalaria intermedia growing in the same plat and on the row next to it. The beetles, after devouring the Crotalaria spectabilis, skipped over the Crotalaria intermedia and started feeding on Biloxi soybeans. They were controlled with sodium fluosilicate. These beetles have been very abundant during the entire month of August and are still showing varietal preferences in soybeans."

Lesser migratory locust found in wide range of altitude.--According to W. B. Cartwright, Sacramento, Calif., "A second appearance of Melanoplus mexicanus Sauss. in alfalfa was reported from Imperial Valley, Calif., the first week in August. This report, as have previous reports and observations in other years, indicates two generations of this species in the Mojave desert and the Imperial Valley. It is of interest to note that M. mexicanus was collected at an elevation of 9,600 feet on the Sonoma Pass on August 6, 1933."

Lesser migratory locust dominant species in North Dakota outbreak.--J. R. Parker, Bozeman, Mont., reports that a cooperative survey of grass-

hopper populations in North Dakota during the first three weeks in August shows that "grasshoppers are present in sufficient numbers to cause some damage next year in every county in the State, ranging from local outbreaks in the lighter infested counties to county-wide damage in the more heavily infested areas. It is highly significant that while Melanoplus bivittatus Say and Camnula pellucida Scudd. were dominant over the eastern two thirds of the State in 1932, M. mexicanus is now the dominant species over the entire State. The greater abundance of this third species complicates both survey and control work, because of its habit of scattering its eggs throughout stubble fields."

Feeding of range caterpillar parasite greatly extends longevity.--Reporting on food tests with 280 Anastatus semiflavus Gahan as a parasite of Hemileuca oliviae Ckll., V. L. Wildermuth, Tempe, Ariz., says: "The parasites were taken from emergence cages that were examined every 24 hours. Only female parasites were used in the tests * * * The parasites were placed in shell vial cages 1 inch by 5 inches, the upper end being closed by a one-holed cork stopper, the lower with a large cotton plug. Food, in liquid form, was usually supplied by saturating a small cotton plug that filled the hole in the cork at the top of the cage. These tests were carried on in a temperature control room at approximately 75° F. Usually 5 or 10 females were used in each test. * * * With 100 parasite females given no food, water, or host eggs the average length of life was 2.63 days; maximum 4 days, and minimum 1 day. The maximum, minimum, and average lengths of life of 80 females given water only were 8, 1, and 3.2 days, respectively. When Hemileuca oliviae eggs alone were supplied the average life of 50 individuals tested was 2.8 days, with a maximum of 10 days and a minimum of 1 day. Fifty females fed honeywater, 1 to 4 solution, lived an average of 23.56 days, 74 days being the longest and 3 days the shortest period of life."

COTTON INSECTS

Boll weevil survival.--R. C. Gaines, Tallulah, La., reports the final results of the emergence of boll weevils in the hibernation cage tests conducted at Tallulah by G. L. Smith; at Florence, S. C., by F. F. Bondy; at College Station, Tex., by E. W. Dunnam; and at Eufaula, Okla., by H. C. Young. A total of 133,300 weevils were placed in the hibernation cages last fall; 500 were placed in each 4 by 4 foot screen-wire cage on or about Oct. 15, Nov. 1, and Nov. 15, 1932. At Florence, Eufaula, and Tallulah 70 cages were installed but at College Station cold weather and snow interfered with the November 15 installation and only 57 cages were installed at that place. The severe winter of 1932-33 caused a high mortality in the western part of the area infested by the boll weevil. At College Station not a single live weevil emerged after May 8 from the 28,500 placed in cages last fall. At Eufaula only 22 of the 35,000 weevils, or 0.06 percent, emerged; and at Tallulah 52 of the 34,800 weevils placed in cages, or 0.15 percent, emerged. At Florence, where the winter of 1932-33 was milder, 2,476 of the 35,000

weevils installed, or 7.07 percent, emerged. It is of interest to note that the activity of the weevils in the cages during April agreed quite closely with the number of weevils active and removed from the cages between May 8 and June 30, 1933, as shown by the following table:

	Total weevils installed Oct.15, Nov. 1, and Nov. 15	Weevils active in April	Weevils active and removed from cages after May 8	Weevils active in April	Weevils active and re- moved after May 8
	<u>Number</u>	<u>Number</u>	<u>Number</u>	<u>Percent</u>	<u>Percent</u>
College Station, Tex.	28,500	6	0	0.0214	0
Eufaula, Okla.	35,000	13	22	.0371	0.06
Tallulah, La.	34,800	49	52	.1400	0.15
Florence, S. C.	35,000	2,811	2,476	8.0314	7.07

The emergence was higher in the cages placed in the woods, in which leaves and twigs were used for shelter, than in any other cages at the three stations. It is now the practice to place boll weevils in the hibernation cages between October 15 and November 15, because tests for many years have shown that a larger survival may be expected from weevils taken in the fields at those dates than from weevils collected before October 15 and after November 15.

Boll weevil develops on althea.--Mr. Gaines also reports that "In August 11 weevils developed in and emerged from althea (Hibiscus syriacus) buds, 5 in buds of a caged plant and 6 in buds of plants growing in the cotton field in the laboratory yard. The latter record is of particular importance because it proves that the weevil will deposit eggs and develop in buds of this plant under natural conditions."

Longevity of boll weevil.--H. C. Young, Eufaula, Okla., reports that "All weevils emerging from the hibernation cages were placed in glass tumblers and fed on cotton seedlings until squares became generally abundant in the cotton fields; then they were fed cotton squares. On September 1, 19.05 percent of these weevils were still alive."

Rainfall increases emergence of cotton flea hopper.--K. P. Ewing, Port Lavaca, Tex., reports that "During the latter part of July a total of 4.68 inches of rain fell. This rainfall had a direct influence on the hatching of hopper eggs in the field, materially accelerating the hatching and, consequently, rapidly increasing the nymphal population * * * For a number of years it has been noticed that rainfall had a direct influence in increasing emergence of flea-hopper nymphs from hibernation cages, but this is the first time that direct proof of this has been obtained under open field conditions."

INSECTS AFFECTING MAN AND ANIMALS

Myiasis further reduced by flytraps.-- In the March 1933 Monthly Letter the percentage reduction in the screw-worm fly population and in attendant cases of myiasis in Dallas County, Texas, and adjoining counties in 1932 through the use of flytraps was noted. H. E. Parish now reports: "The number of cases of myiasis recorded in 122,334 animals of all classes in the trapped area during the month (August) amounted to 261, or an infestation of 0.2133 percent. In 69,565 animals of all classes in the control area the number of cases recorded amounted to 335, or an infestation of 0.4815 percent. The percentage infestation as recorded in each of the two areas indicates a reduction of 55.7 percent in the number of screw-worm cases in the trapped area as compared to the control area. * * * The semimonthly records of the relative fly abundance in the trapped and control areas, as determined by the jar method, indicate that a reduction of the total fly population in the trapped area amounted to 88.02 percent on August 3 and to 93.87 percent on August 18. These records show also that in the trapped area the reduction of the screw-worm fly (Cochliomyia macellaria Fab.), which composed from 90.5 to 96.1 percent of the total of all species of blowflies present, amounted to 91.38 percent on August 3 and to 95.64 percent on August 18, as compared to the abundance of this species in the control area. * * * a fine example of the efficiency that may be obtained by the systematic operation of flytraps over large areas."

Sulphides increase efficiency of blowfly baits.--E. W. Laake, Dallas and Menard, Tex., reports that "Experiments conducted during the month (August) indicate that the addition of 1 percent solutions of sodium and potassium sulphide instead of water for replacing the quantity of liquid lost from meat baits through evaporation increases the catch over 100 percent and also increases the longevity of meat baits considerably, as compared to the check baits. Results obtained during the same period indicate also that a bait consisting of 1 pound of air-dried flies and 1 gallon of a 1 percent solution of sodium sulphide is superior to a bait containing 2 pounds of fresh meat and 1 gallon of water for short periods of exposure."

Derris-pyrethrum extract eliminates goat lice.--According to O. G. Babcock, Sonora, Tex., "A lousy goat that was treated with a deris-pyrethrum extract mixture, 1 part to 400 parts of water, is free from goat lice after a period of observation covering 116 days. The same results have held good in another test using a dilution of 1 part to 800 parts water."

Toxicity of rotenone and pyrethrum to Culex mosquitoes.--Reporting on a series of toxicity tests with larvae of Culex sp., W. V. King, Orlando, Fla., says, "With an acetone solution of rotenone, complete killing within 24 hours was obtained at dilutions up to 1 to 4,000,000."

* * * In the tests with pyrethrum extracts, an effort was made to devise a technique that would give uniform results at high dilutions of the kerosene base, this having proved to be the principal difficulty encountered in determining the relative toxicity of different extracts. Most of the tests were made with a kerosene extract representing approximately 12 percent of pyrethrum (1 pound of pyrethrum flowers to 1 gallon of oil) and the preliminary emulsions were made with penetrol (a commercial sulphonated oil), glue, or a trimethylamine soap. Complete killing in all tests was obtained at a dilution of 1 gram of pyrethrum to 400,000 cubic centimeters of water), but above this the results were quite erratic, complete or nearly complete killing occurring in some of the tests at 1 to 2,000,000, while other tests gave no kill at all. Therefore the diluting technique will require still further improvement."

